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Miki et al.

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(54) **BICYCLE COMPONENT CONTROL DEVICE**

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B62K 23/06 (2006.01)
B62M 25/04 (2006.01)

(52) **U.S. Cl.**
CPC ***B62M 25/04*** (2013.01); ***B62K 23/06*** (2013.01); *Y10T 74/2003* (2015.01); *Y10T 74/20037* (2015.01); *Y10T 74/20396* (2015.01); *Y10T 74/20612* (2015.01)

(58) **Field of Classification Search**
CPC B62K 23/06; B62M 25/04
USPC 74/502.2, 504, 489, 491; 188/344
See application file for complete search history.

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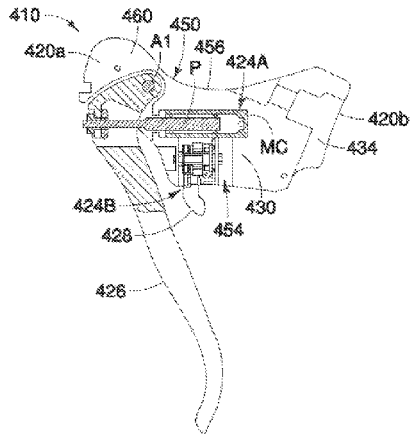
Primary Examiner — Vinh Luong
(74) *Attorney, Agent, or Firm* — Global IP Counselors

(57) **ABSTRACT**

A bicycle component control device includes a bracket, a hydraulic brake unit and either a mechanical shifting unit or electric control unit. The bracket has a gripping portion. The hydraulic brake unit is operatively mounted on the bracket and configured to operate a hydraulic brake device. The mechanical shifting unit or the electric control unit is operatively mounted on the bracket and configured to operate a bicycle device.

9 Claims, 9 Drawing Sheets



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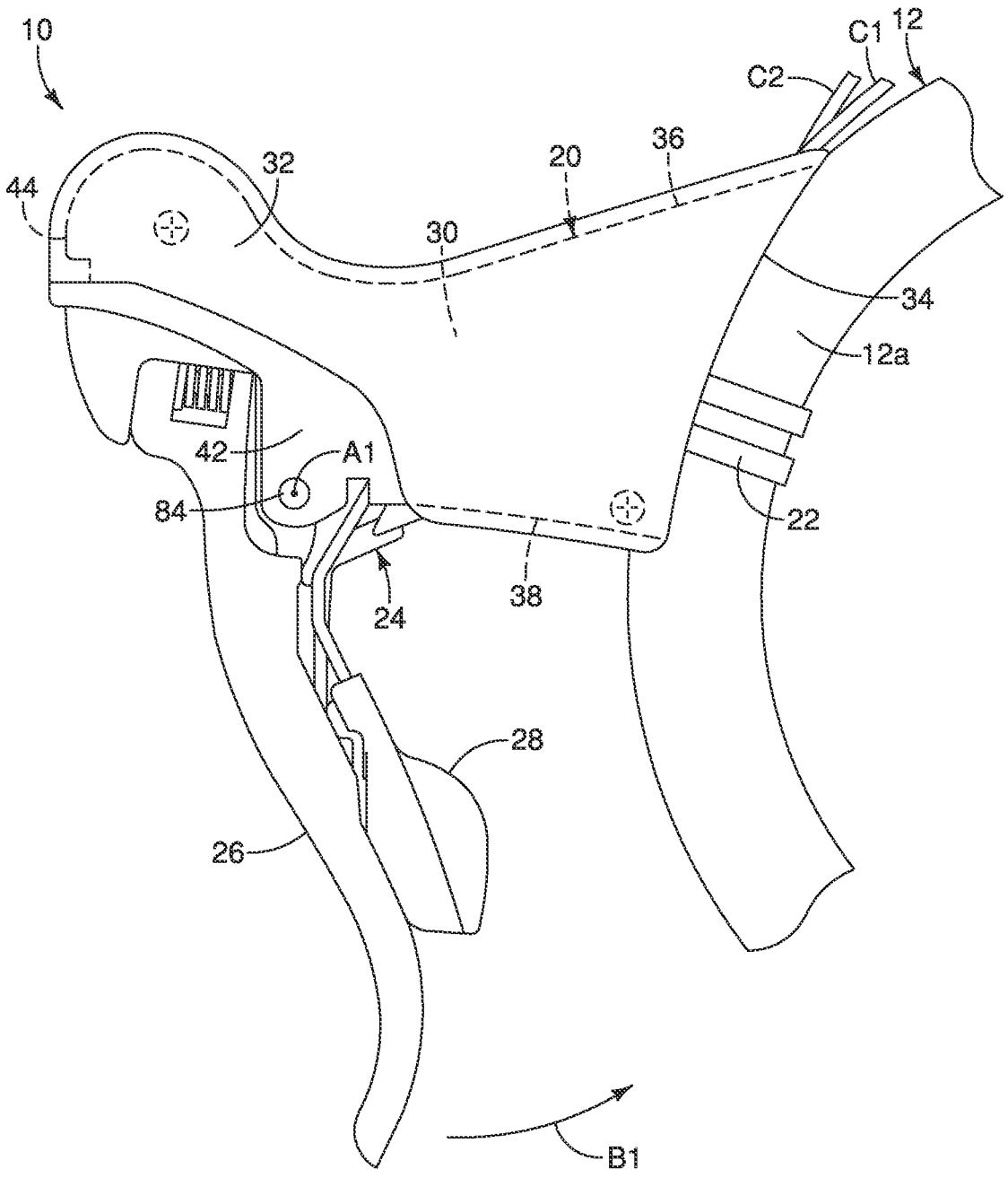
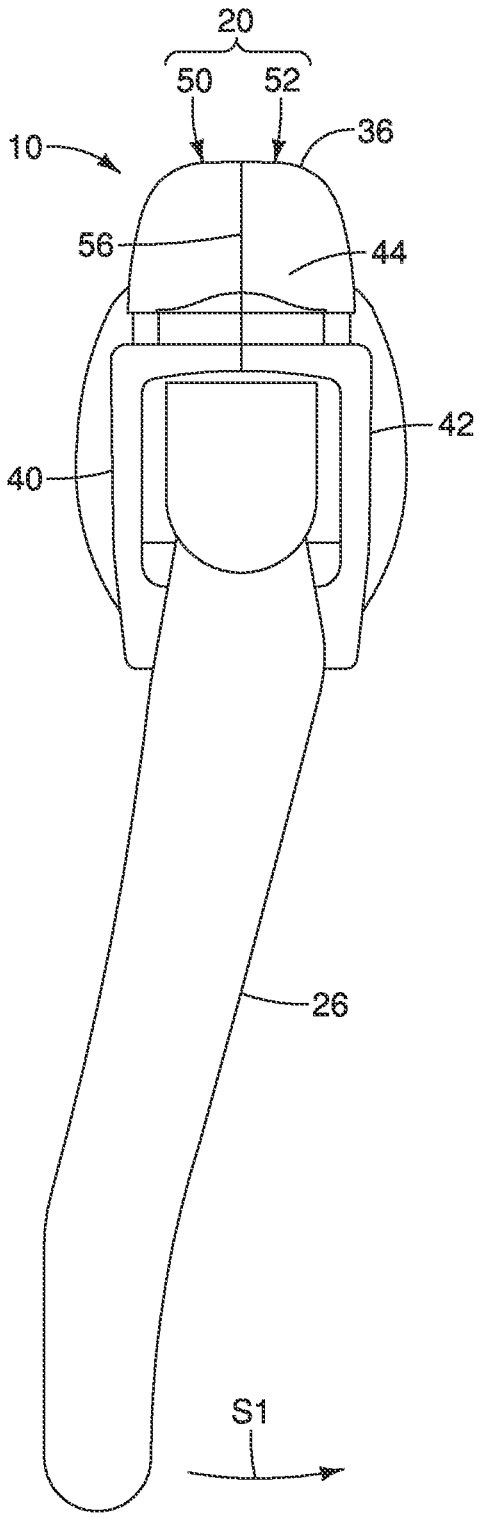


FIG. 1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50
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36
56
44
42
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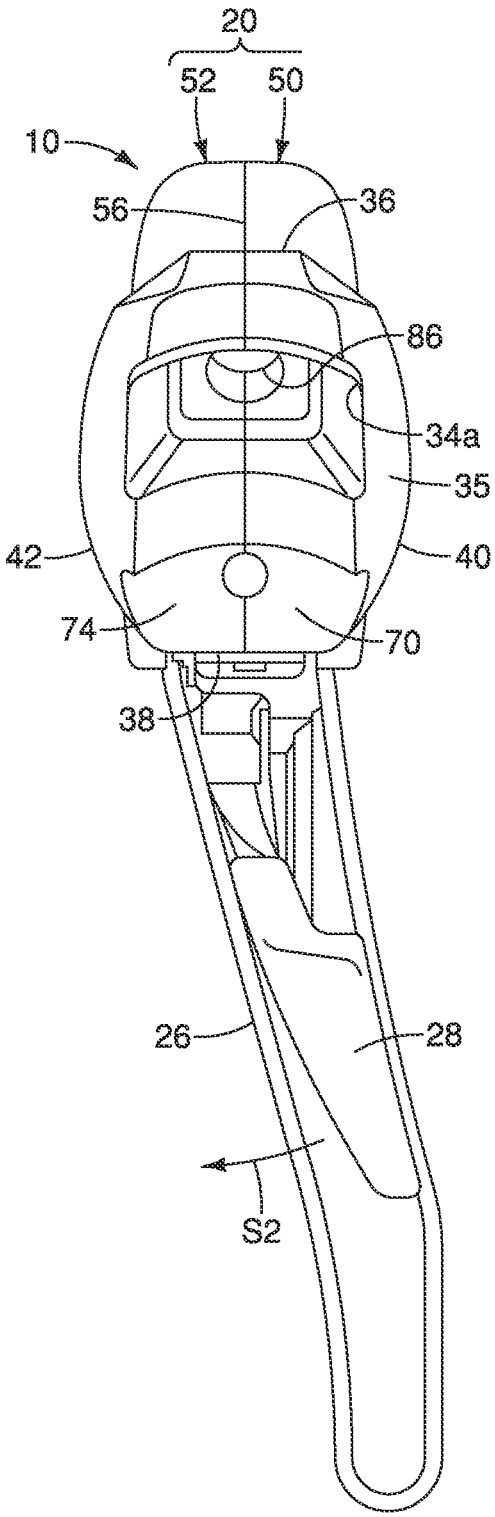
26
S1

FIG. 2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52
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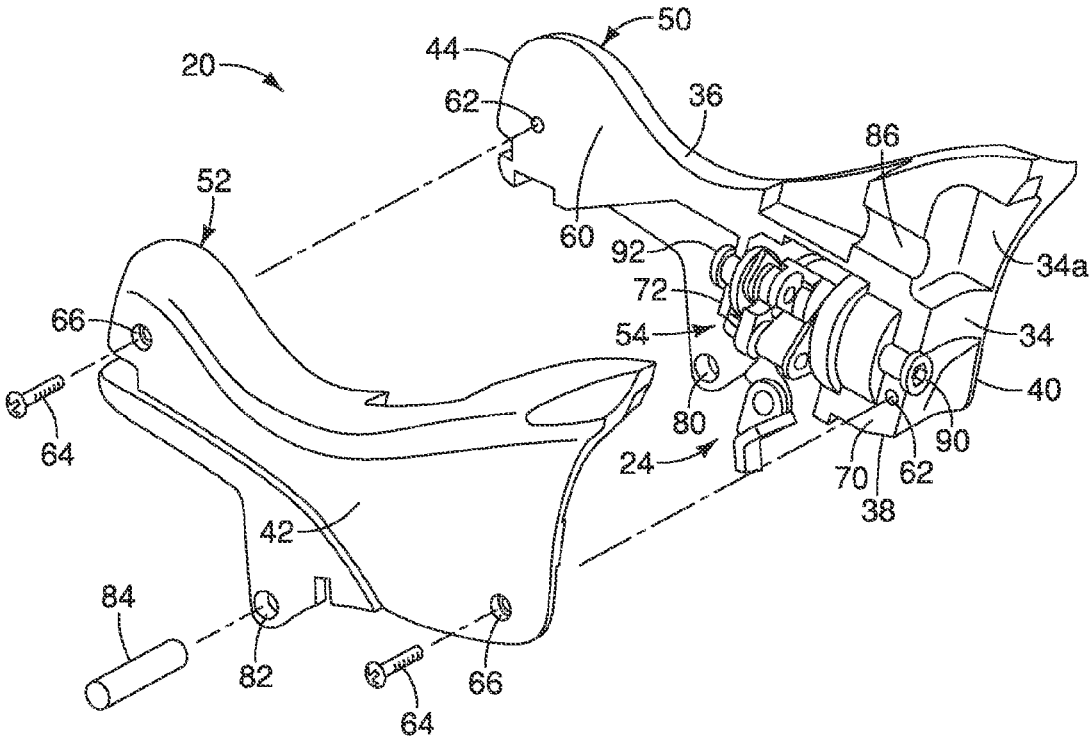
10
56
36
86
34a
35
42
40
74
70
38
26
28
S2

FIG. 3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44
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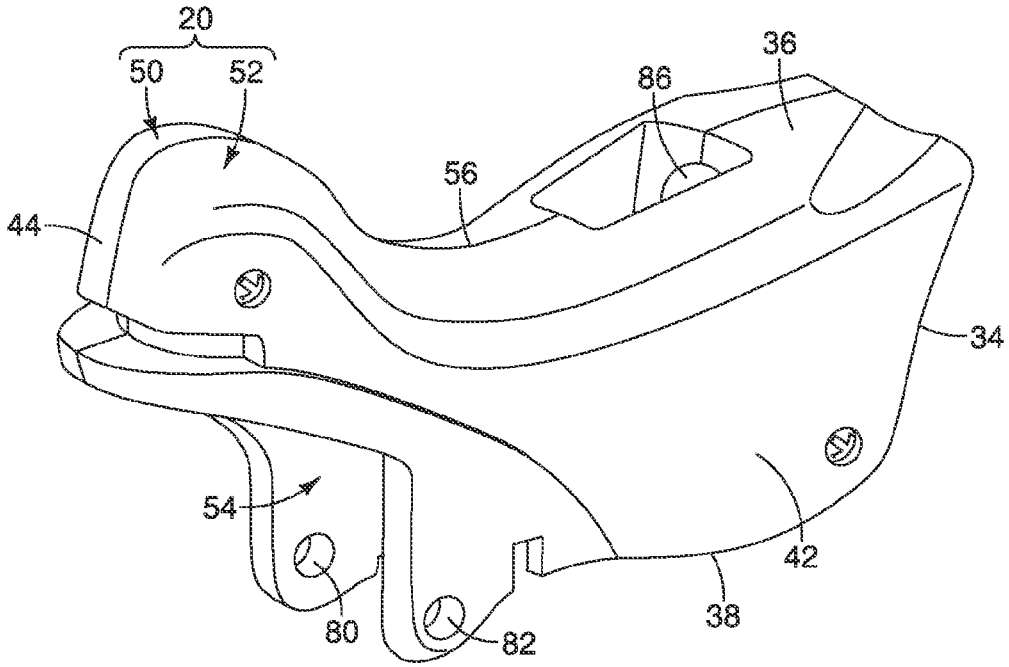
62
36
86
52
60
92
34a
72
66
54
34
40
64
80
90
24
70
62
38
42
84
82
66
64

FIG. 4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86
36
56
44
34
54
42
38
80
82

FIG. 5

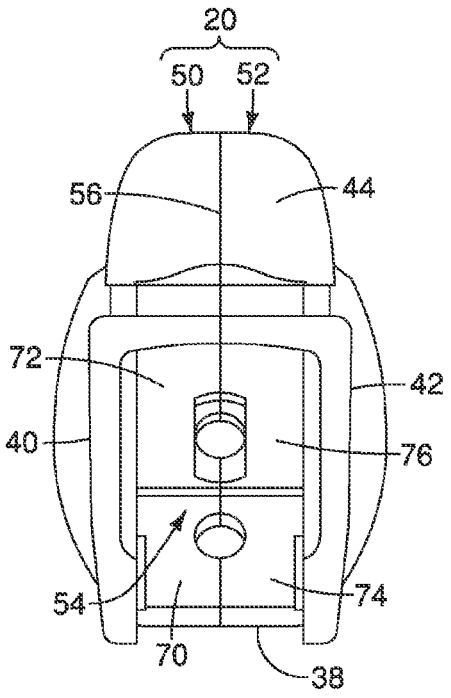

FIG. 6

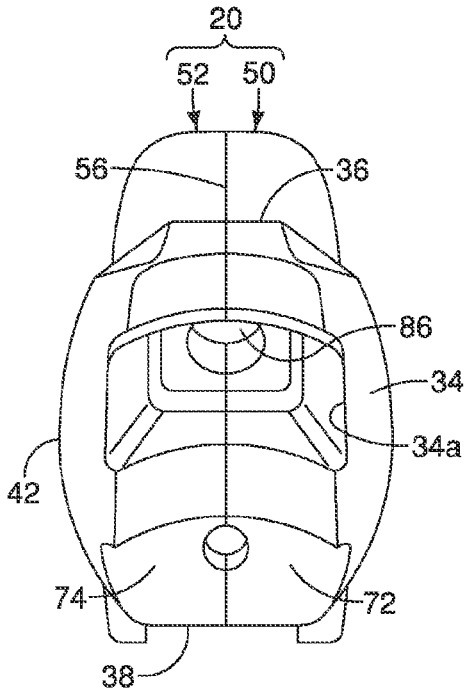

FIG. 7

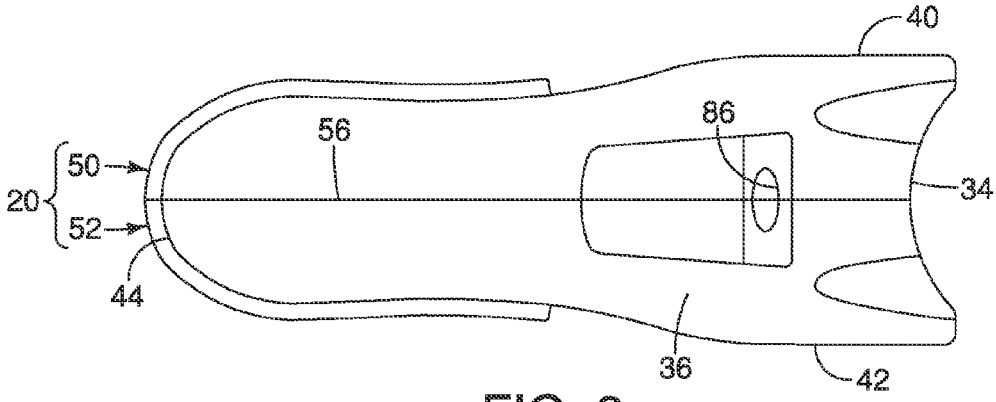

FIG. 8

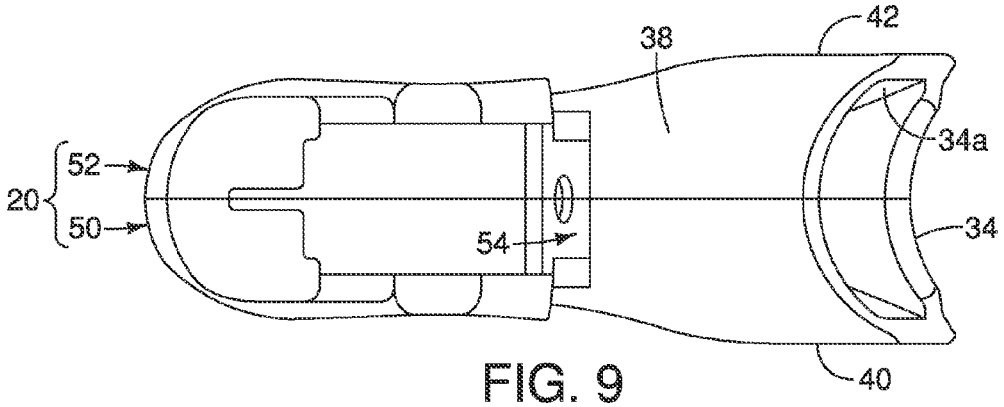

FIG. 9

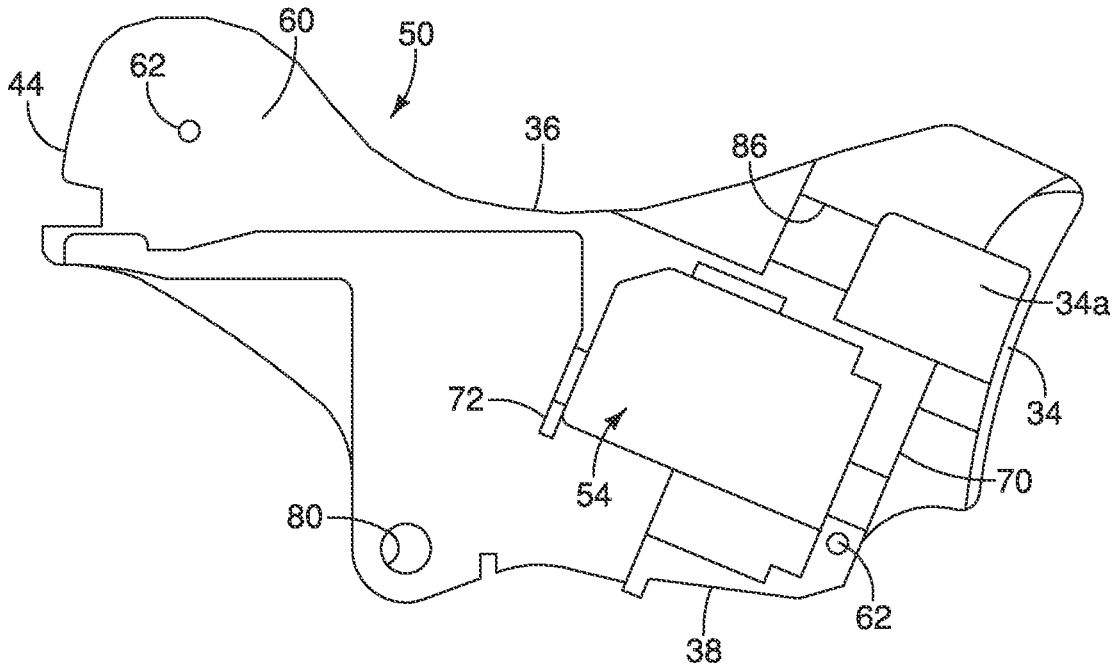
60
50
62
44
36
86
34a
72
34
54
70
80
62
38

FIG. 10

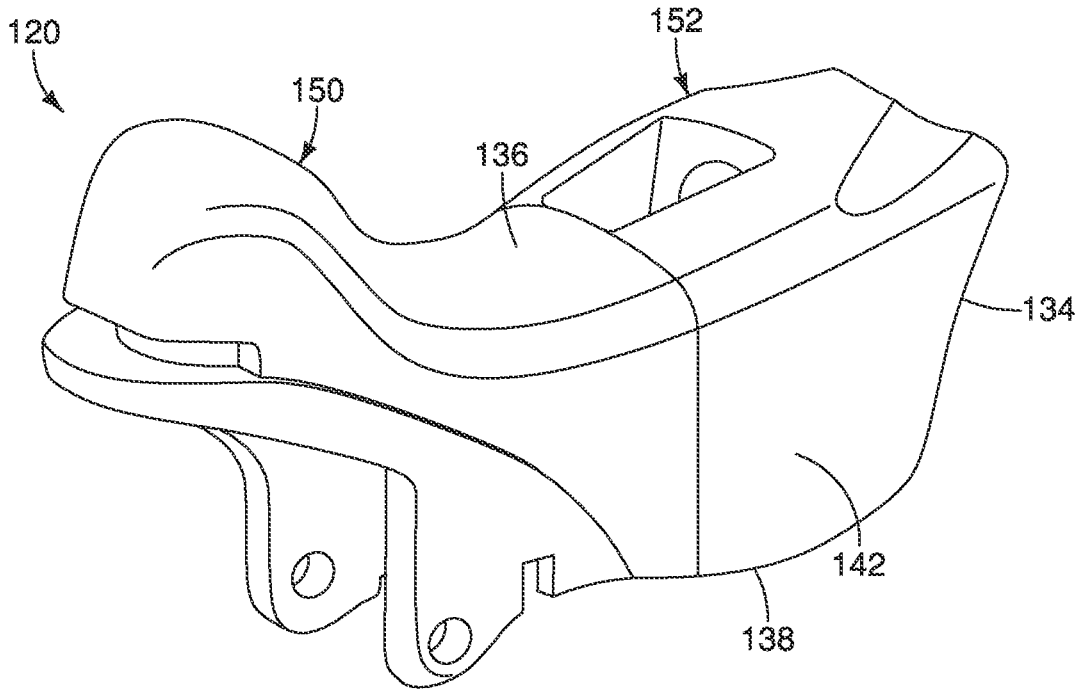
120
152
150
136
134
142
138

FIG. 11

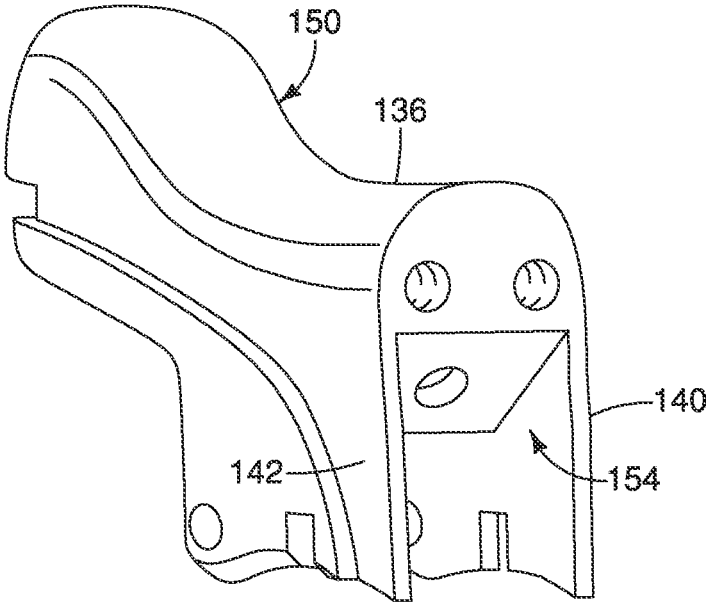

FIG. 12

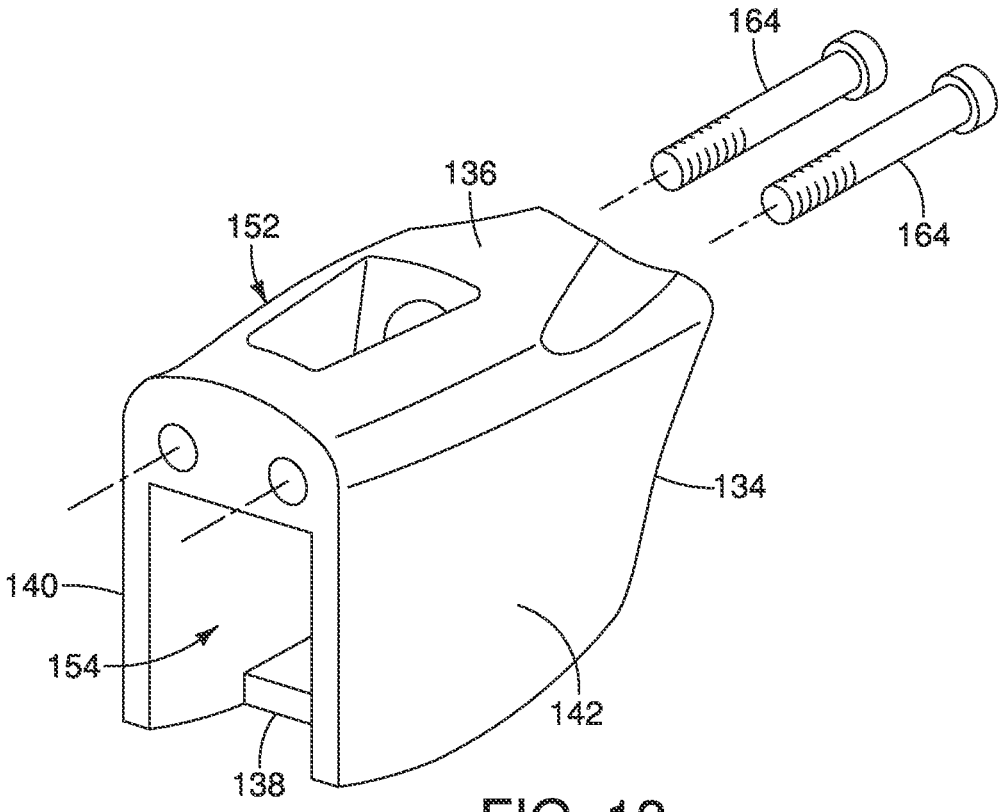

FIG. 13

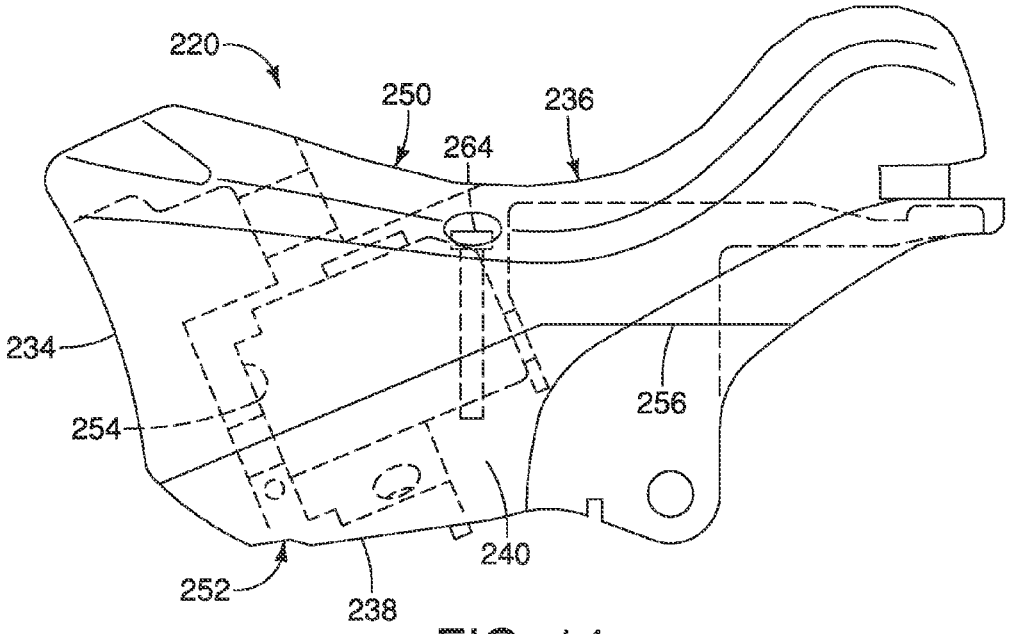

FIG. 14

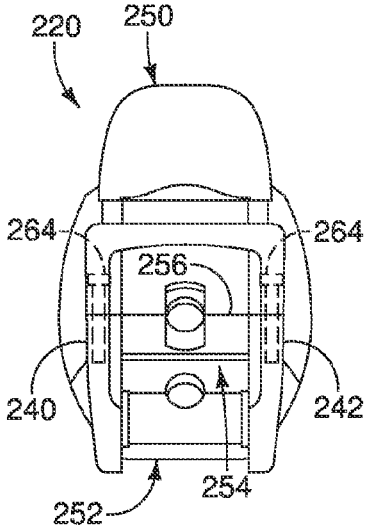

FIG. 15

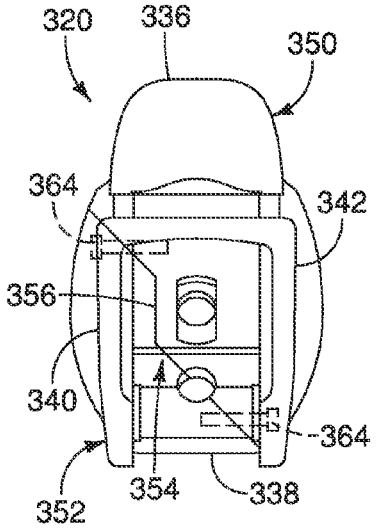

FIG. 16

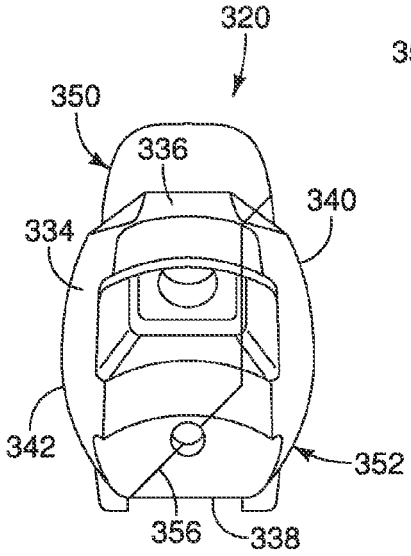

FIG. 17

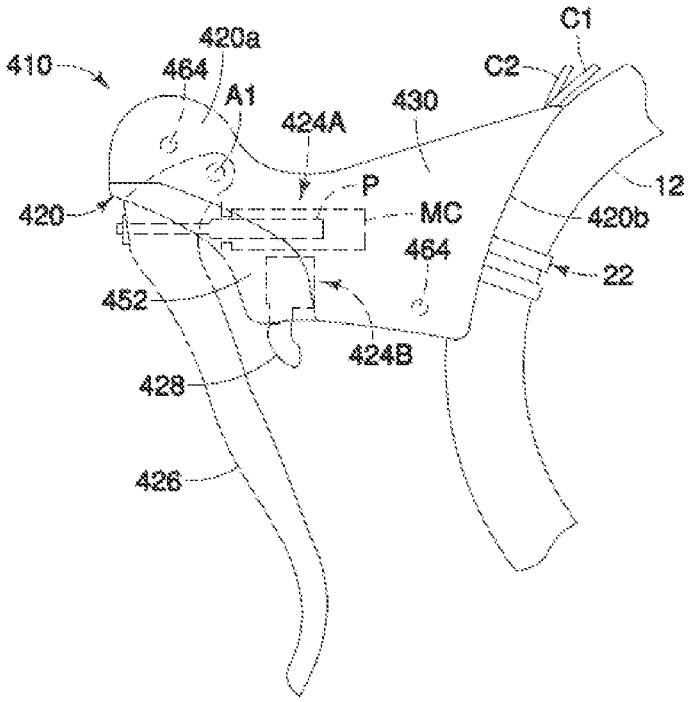
410
420a
464
A1
424A
430
C1
C2
12
420
P
MC
420b
464
22
452
424B
428
426

FIG. 18

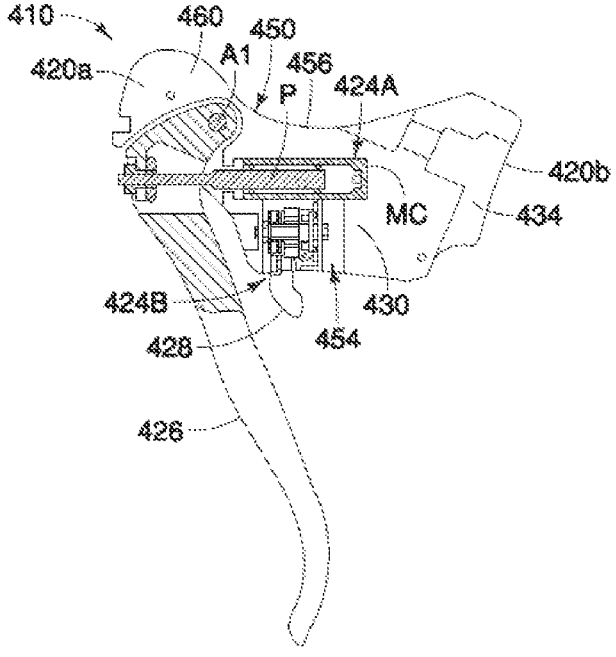
410
460
450
A1
456
420a
P
424A
420b
MC
434
424B
430
454
428
426

FIG. 19

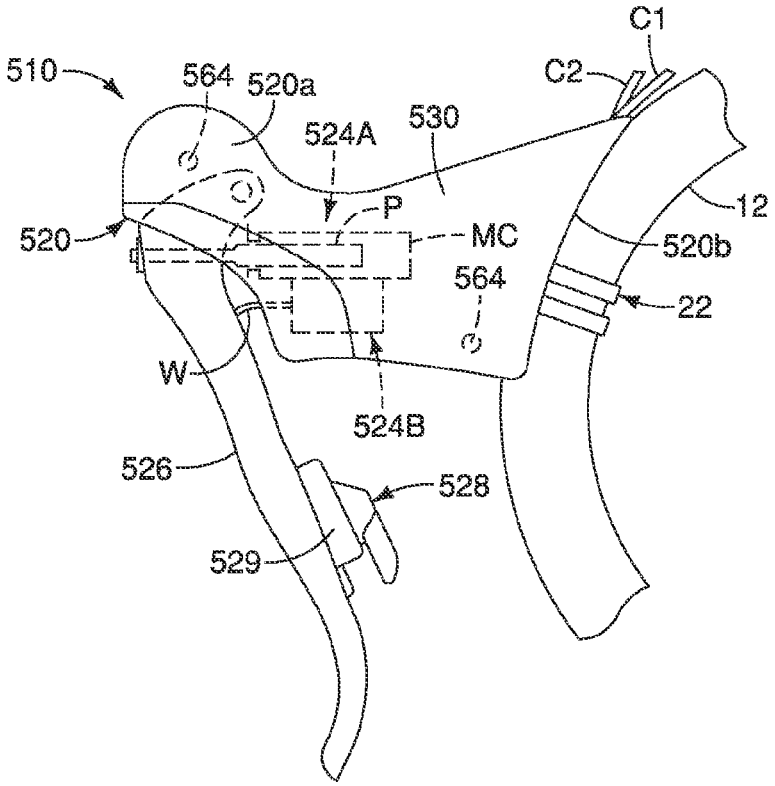
C1
510
564
520a
C2
524A
530
12
P
520
MC
520b
564
22
W
524B
526
528
529

FIG. 20

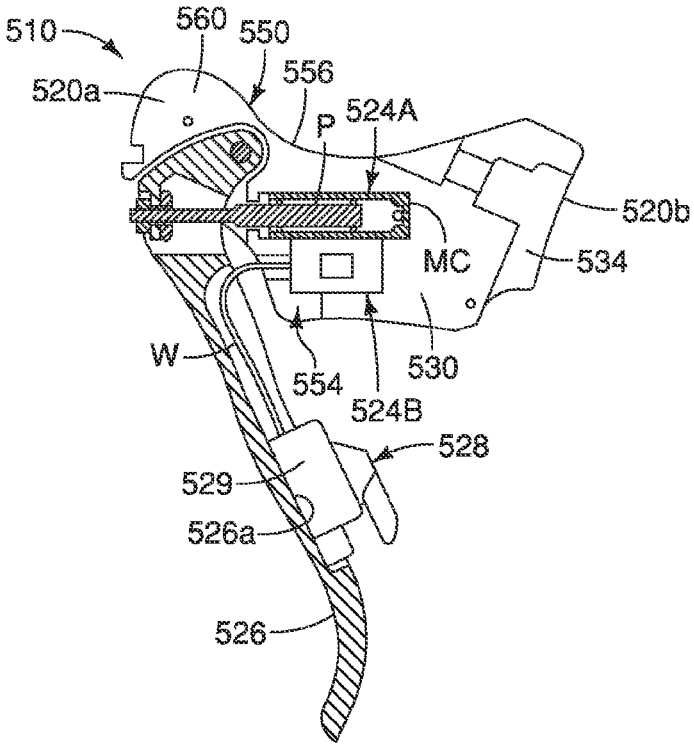
510
560
550
556
520a
P
524A
520b
MC
534
W
554
530
524B
528
529
526a
526

FIG. 21

BICYCLE COMPONENT CONTROL DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a divisional application of U.S. patent application Ser. No. 13/195,050 filed on Aug. 1, 2011. The entire disclosure of U.S. patent application Ser. No. 13/195,050 is hereby incorporated herein by reference.

BACKGROUND

1. Field of the Invention

This invention generally relates to a bicycle component control device. More specifically, the present invention relates to a bicycle component control device having a hydraulic brake unit in combination with either a mechanical shifting unit or an electric control unit.

2. Background Information

Bicycles typically include one or more bicycle component control devices for controlling various bicycle components such as a hydraulic brake device or a gear changing device. Some of these bicycle component control devices have a bracket with an interior space that houses a bicycle component operating unit. The bicycle component operating unit is often provided with one or more operating levers that extend out of the bracket such that the rider can operate the bicycle component operating unit. One example of bicycle component control devices having this type of configuration are disclosed in U.S. Patent Application Publication No. 2011/0079103.

SUMMARY

In accordance with one aspect presented in this disclosure, a bicycle component control device is proposed that basically comprises a bracket, a mechanical shifting unit and a hydraulic brake unit. The bracket has a gripping portion. The mechanical shifting unit is operatively mounted on the bracket and configured to operate a gear shifting device. The hydraulic brake unit is operatively mounted on the bracket and configured to operate a hydraulic brake device.

In accordance with another aspect presented in this disclosure, a bicycle component control device is proposed that basically comprises a bracket, an operating member, a hydraulic brake unit and an electric control unit. The bracket has a distal end portion, a proximal end portion and a gripping portion arranged between the distal end portion and the proximal end portion. The proximal end portion has a mounting surface facing a bicycle handlebar. The operating member is pivotally attached to the distal end portion of the bracket about a pivot axis. The hydraulic brake unit is operatively mounted on the bracket and configured to operate a hydraulic brake device. The hydraulic brake unit has a piston member that is moved toward the mounting surface in response to operation of the operating member. The electric control unit is operatively mounted on at least one of the bracket and the operating member to operate a bicycle electric device.

In accordance with yet another aspect presented in this disclosure, a bicycle component control device is proposed that basically comprises a bracket, an operating member, a hydraulic brake unit and an electric control unit. The bracket has a gripping portion. The operating member is pivotally attached to the bracket about a pivot axis. The hydraulic brake unit is operatively mounted on the bracket and configured to operate a hydraulic brake device. The hydraulic brake unit has a master cylinder located rearward of the pivot axis of the operating member while the bicycle component control device is in an installed position. The electric control unit is operatively mounted on at least one of the bracket and the operating member to operate a bicycle electric device.

These and other objects, features, aspects and advantages of bicycle component control devices disclosed herein will become apparent to those skilled in the art from the following detailed description, which, taken in conjunction with the annexed drawings, discloses preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the attached drawings which form a part of this original disclosure:

FIG. **1** is an inside elevational view of a bicycle component control device in accordance with a first embodiment;

FIG. **2** is a front elevational view of the bicycle component control device illustrated in FIG. **1** with the brake/shift operating lever and the shift (release) lever in their rest positions;

FIG. **3** is a rear elevational view of the bicycle component control device illustrated in FIGS. **1** and **2** with the brake/shift operating lever and the shift (release) lever in their rest positions;

FIG. **4** is an exploded perspective view of the bicycle component control device illustrated in FIGS. **1** to **3**;

FIG. **5** is a perspective view of the bracket that supports the bicycle component operating unit of the bicycle component control device illustrated in FIGS. **1** to **4**;

FIG. **6** is a front elevational view of the bracket illustrated in FIG. **5** for supporting the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **7** is a rear elevational view of the bracket illustrated in FIGS. **5** and **6** for supporting the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **8** is a top plan view of the bracket illustrated in FIGS. **5** to **7** for supporting the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **9** is a bottom plan view of the bracket illustrated in FIGS. **5** to **8** for supporting the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **10** is an interior side elevational view of the bracket illustrated in FIGS. **5** to **9** of one of the bracket parts for supporting the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **11** is a perspective view of a bracket in accordance with a second embodiment that supports the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **12** is a perspective view of the first bracket part of the bracket illustrated in FIG. **11**;

FIG. **13** is a perspective view of the second bracket part of the bracket illustrated in FIG. **11**;

FIG. **14** is an outside elevational view of a bracket in accordance with a third embodiment that supports the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **15** is a front elevational view of the bracket that is illustrated in FIG. **14**;

FIG. **16** is a front elevational view of a bracket in accordance with a fourth embodiment that supports the bicycle component operating unit illustrated in FIGS. **1** to **4**;

FIG. **17** is a rear elevational view of the bracket that is illustrated in FIG. **16**;

FIG. **18** is an inside elevational view of a bicycle component control device in accordance with a fifth embodiment;

FIG. **19** is an interior side elevational view of the bracket illustrated in FIG. **18** of one of the bracket parts for supporting a hydraulic brake unit and a mechanical shifting unit;

FIG. **20** is an inside elevational view of a bicycle component control device in accordance with a sixth embodiment; and

FIG. **21** is an interior side elevational view of the bracket illustrated in FIG. **20** of one of the bracket parts for supporting a hydraulic brake unit and an electric control unit that can be either an electric shift unit or a non-shifting control unit.

DETAILED DESCRIPTION OF EMBODIMENTS

Selected embodiments will now be explained with reference to the drawings. It will be apparent to those skilled in the art from this disclosure that the following descriptions of the embodiments are provided for illustration only and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.

Referring initially to FIG. **1**, a bicycle component control device **10** is illustrated in accordance with a first embodiment. The bicycle component control device **10** is mounted on a drop down handlebar **12**. In the illustrated embodiment, the bicycle component control device **10** is a road bicycle brake/shift device. The bicycle component control device **10** is a right hand side control device operated by the rider's right hand to operate a first brake device (not shown) and a first gear shifting device (not shown, e.g., a cable operated rear derailleur). It will be apparent to those skilled in the art that the configuration of the bicycle component control device **10** can be adapted to a left hand side control device that is operated by the rider's left hand.

As used herein to describe the above embodiment(s), the following directional terms "upper", "lower", "forward", "rearward", "above", "downward", "vertical", "horizontal", "below" and "transverse" as well as any other similar directional terms refer to those directions of a bicycle equipped with the bicycle component control device. Accordingly, these terms, as utilized to describe the bicycle component control device should be interpreted relative to a bicycle equipped with the bicycle component control device as used in the normal riding position on a horizontal surface in an upright position. Finally, terms of degree such as "substantially", "about" and "approximately" as used herein mean a reasonable amount of deviation of the modified term such that the end result is not significantly changed.

As seen in FIGS. **1** to **4**, the bicycle component control device **10** basically includes a bracket **20**, a clamp **22** and a bicycle component operating unit **24** with a pair of operating members **26** and **28**. As discussed below, the clamp **22** is fixed to the bracket **20** for attaching the bracket **20** to a curved portion **12***a* of the handlebar **12**. The bicycle component operating unit **24** is disposed inside the bracket **20** and the operating members **26** and **28** protrude out of the bracket **20**. In the first illustrated embodiment, the bicycle component operating unit **24** is a mechanical shifting unit. However, the bicycle component operating unit **24** is not limited to a mechanical shifting unit. Rather, as will become apparent from the later embodiments, the bicycle component operating unit **24** can be an electric control unit that is either a non-shifting control unit or an electric shift unit. Moreover, the bicycle component operating unit **24** can be a hydraulic brake unit. In addition, the bracket **20** can also be configured to support two or more operating units such as, but not limited to, a hydraulic brake unit, a mechanical shifting unit, a non-shifting control unit and an electric shift unit.

As seen in FIG. **1**, the bracket **20** has a gripping portion **30** disposed between a pivot axis A1 of the operating member **26** and the clamp **22**. Typically, the bracket **20** is made of a rigid, hard material. Thus, a grip cover **32** is stretched over at least the gripping portion **30** of the bracket **20** to provide a cushion to the portion **30** of the bracket **20** and to provide an attractive appearance. Typically, the grip cover **32** is made of elastic material such as rubber.

Referring now to FIGS. **1** to **3**, the bracket **20** has a mounting surface **34**, an upper surface **36**, a lower surface **38**, a first side surface **40** and a second side surface **42**. The mounting surface **34** has a recess **34***a* for receiving the clamp **22** for mounting the mounting surface **34** against the bicycle handlebar **12**. Preferably, the mounting surface **34** has a generally curved configuration that mates with the curvatures of the curved portion **12***a* of the bicycle handlebar **12**. The upper surface **36** extends from the mounting surface **34** to a free end **44** of the bracket **20**. The lower surface **38** extends from the mounting surface **34** to the free end **44** of the bracket **20**. The first side surface **40** extends from the mounting surface **34** to the free end **44** of the bracket **20** in the area between the upper and lower surfaces **36** and **38**. The second side surface **42** extends from the mounting surface **34** to the free end **44** of the bracket **20** in the area between the upper and lower surfaces **36** and **38**.

Referring now to FIGS. **4** to **10**, the bracket **20** includes a first bracket part **50** and a second bracket part **52**. The first and second bracket parts **50** and **52** are separate pieces from each other, and mate together to define an interior space **54**. The interior space **54** is configured to constitute an operating unit receiving cavity. Thus, the bicycle component operating unit **24** is disposed in the interior space **54** formed between the first and second bracket parts **50** and **52** of the bracket **20**. The first and second bracket parts **50** and **52** are non-movably fixed to each other for defining the interior space **54** therebetween such that the first and second bracket parts **50** and **52** both support the bicycle component operating unit **24**.

The first and second bracket parts **50** and **52** are further configured relative to each other such that a connecting seam **56** is formed on the exterior surface of the bracket **20**. In this first ebodiment, the connecting seam **56** is formed between the first and second bracket parts **50** and **52** such that the connecting seam **56** separates the bracket **20** along the mounting surface **34**, the upper surface **36**, the lower surface **38** and the free end **44**. However, as will be apparent from the later embodiments, the connecting seam **56** can have other configurations. For of the purpose of strength and durability, the connecting seam **56** extends along at least three of mounting surface **34**, the upper surface **36**, the lower surface **38**, the first side surface **40** and the second side surface **42**.

In the first illustrated embodiment, the first and second bracket parts **50** and **52** are each made of a rigid, hard plastic material. Preferably, as illustrated, the first and second bracket parts **50** and **52** are formed by injection molding. Thus, the first and second bracket parts **50** and **52** are injection molded parts in the illustrated embodiment. More preferably, each of the first and second bracket parts **50** and **52** is formed using a draw molding machine using two molds or dies such that the first and second bracket parts **50** and **52** are formed without hidden surfaces. The draw direction refers to the direction in which the two molds or dies will separate to release from the bracket part **50** or **52** from the two molds or dies. The draw direction is also called a line of draw. In the context of injection molded parts, the term "hidden surface" refers to a surface of the injection molded part that cannot be seen while viewing the injection molded part in the draw direction. These hidden surfaces of the injection molded parts are often formed using slides that move into a cavity perpendicular to the draw direction for creating undercuts or overhanging features. Thus, as illustrated, the first and second bracket parts **50** and **52** are injection molded parts that have no

hidden surfaces with respect to the draw direction. In this way, the molds or dies can be relatively simple, and the bracket part **50** or **52** can be easily ejected from the molds or dies.

In the illustrated embodiment, the first and second bracket parts **50** and **52** are mirror images of each other, except that the first bracket part **50** has an interior face **60** that has a pair of blind bores **62** for threadedly receiving a pair of fasteners or screws **64**, respectively, while the second bracket part **52** has a pair of stepped through bores **66** for receiving the fasteners **64** therethrough. Since the through bores **66** are stepped, the head of the fasteners **64** are recessed from the exterior surface of the second bracket part **52**. Thus, the first and second bracket parts **50** and **52** are non-movably fixed to each other by the fasteners **64**. Of course, other types of fastening arrangements can be used to non-movably fix the first and second bracket parts **50** and **52** together as needed and/or desired.

In the first illustrated embodiment, the first bracket part **50** has a pair of support portions **70** and **72** that are configured and arranged to contact and support a first side of the bicycle component operating unit **24**. Likewise, the second bracket part **52** has a pair of support portions **74** and **76** that are configued and arranged to contact and support a second side of the bicycle component operating unit **24**. In die first illustrated embodiment, the support portions **70**, **72**, **74** and **76** constitute shaft engagement portions of the bracket **20**.

In the first illustrated embodiment, the first bracket part **50** has a first pivot hole **80** and the second bracket part **52** has a second pivot hole **82**. The first and second pivot holes **80** and **82** receive a pivot pin **84** that defines the pivot axis A**1**, The pivot pin **84** pivotally supports the operating member **26** to the bracket **20** for movement in a direction B**1** (FIG. **1**).

The clamp **22** is a conventional handlebar clamp that is often used for road style shifters. In the first illustrated embodiment, the clamp **22** is sandwiched between the first and second bracket parts **50** and **52**. In particular, the first and second bracket parts **50** and **52** mate together to form the clamp receiving recess **34***a*, as mentioned above, and a bolt receiving recess **86**.

In the first illustrated embodiment, the bicycle component operating unit **24** is a conventional mechanical shifting unit that pulls or releases a shift cable C**1** (FIG. **1**) that is connected to a gear shifting device. The operating member **26** is configured to perform a cable pulling operation, while the operating member **28** is configured to perform a cable releasing operation. Thus, the operating member **26** constitutes a pulling lever, while the operating member **28** constitutes a release lever. The operating member **26** is also configured to perform a braking operation by pulling a brake cable C**2**. Thus, the operating member **26** constitutes a brake/shift operating lever that functions as a brake lever by the rider pivoting the operating member **26** about the pivot axis A**1** relative to the bracket **20** towards the curved portion **12***a* of the handlebar **12**. As seen in FIGS. **2** and **3**, operating members **26** and **28** are moved in a lateral direction towards a vertical longitudinal center plane of the bicycle to perform shifting operations. The bicycle component operating unit **24** has a pair of mounting fasteners **90** and **92** that are supported by the support portions **70**, **72**, **74** and **76** of the first and second bracket parts **50** and **52**. The mounting fasteners **90** and **92** are fixed to a main axle structure of the bicycle component operating unit **24**. The first and second bracket parts **50** and **52** can be provided with other structures that cooperate with the bicycle component operating unit **24** to aid in supporting and/or the operation of the bicycle component operating unit **24** as needed and/or desired.

It will be apparent from this disclosure that any type of mechanical shifting unit can be used with the bracket **20** by reconfiguring the interior space **54** to match the configuration of the mechanical shifting unit. Thus the bicycle component operating unit **24** will not be discussed in further detail herein.

Referring now to FIGS. **11** to **13**, a bracket **120** in accordance with a second embodiment will now be explained. The bracket **120** is configured to be used with the clamp **22** and the bicycle component operating unit **24** of the first embodiment. The bracket **120** has a mounting surface **134**, an upper surface **136**, a lower surface **138**, a first side surface **140** and a second side surface **142**. Here, the bracket **120** includes a first bracket part **150** and a second bracket part **152**. The first and second bracket parts **150** and **152** are separate pieces from each other, and mate together to define an interior space **154**. The first and second bracket parts **150** and **152** are non-movably fixed to each other by a pair of fasteners or screws **164**. The first and second bracket parts **150** and **152** are further configured relative to each other such that a connecting seam **156** is formed on the exterior surface of the bracket **120**. In this second embodiment, the connecting seam **156** is formed between the first and second bracket parts **150** and **152** such that the connecting seam **156** separates the bracket **120** along the upper surface **136**, the lower surface **138** and the first and second side surfaces **140** and **142**. When the first and second bracket parts **150** and **152** are fixed together, the bracket **120** is identical to the brkket **20** except for orientation of the connecting seam **156** and the fastening arrangement between the first and second bracket parts **150** and **152** using the fasteners or screws **164**.

Referring now to FIGS. **14** and **15**, a bracket **220** in accordance with a third embodiment will now be explained. The bracket **220** is configured to be used with the clamp **22** and the bicycle component operating unit **24** of the first embodiment. The bracket **220** has a mounting surface **234**, an upper surface **236**, a lower surface **238**, a first side surface **240** and a second side surface **242**. Here, the bracket **220** includes a first bracket part **250** and a second bracket part **252**. The first and second bracket parts **250** and **252** are separate pieces from each other, and mate together to define an interior space **254**. The first and second bracket parts **250** and **252** are non-movably fixed to each other by a pair of fasteners or screws **264**. The first and second bracket parts **250** and **252** are further configured relative to each other such that a connecting seam **256** is formed on the exterior surface of the bracket **220**. In this third embodiment, the connecting seam **256** is formed between the first and second bracket parts **250** and **252** such that the connecting seam **256** separates the bracket **220** along the mounting surface **234** and the first and second side surfaces **240** and **242**. When the first and second bracket parts **250** and **252** are fixed together, the bracket **220** is identical to the bracket **20** except for orientation of the connecting seam **256** and the fastening arrangement between the first and second bracket parts **250** and **252** using the fasteners or screws **264**.

Referring now to FIGS. **16** and **17**, a bracket **320** in accordance with a fourth embodiment will now be explained. The bracket **320** is configured to be used with the clamp **22** and the bicycle component operating unit **24** of the first embodiment. The bracket **320** has a mounting surface **334**, an upper surface **336**, a lower surface **338**, a first side surface **340** and a second side surface **342**. Here, the bracket **320** includes a first bracket part **350** and a second bracket part **352**. The first and second bracket parts **350** and **352** are separate pieces from each other, and mate together to define an interior space **354**. The first and second bracket parts **350** and **352** are non-movably fixed to each other by a pair of fasteners or screws **364**. The first and second bracket parts **350** and **352** are further configured rela-

tive to each other such that a connecting seam **356** is formed on the exterior surface of the bracket **320**. In this fourth embodiment, the connecting seam **356** is formed between the first and second bracket parts **350** and **352** such that the connecting seam **356** separates the bracket **320** along the mounting surface **334**, the lower surface **338** and the first side surface **340**. Alternatively, the connecting seam can be formed such that the connecting seam separates the bracket **320** into two bracket parts such that the connecting seam separates the bracket **320** along the mounting surface **334**, the upper surface **336** and the second side surface **342**. When the first and second bracket parts **350** and **352** are fixed together, the bracket **320** is identical to the bracket **20** except for orientation of the connecting seam **356** and the fastening arrangement between the first and second bracket parts **350** and **352** using the fasteners or screws **364**.

Referring now to FIGS. **18** and **19**, a bicycle component control device **410** in accordance with a fifth embodiment will now be explained. The bicycle component control device **410** has a bracket **420** is configured to be used with the clamp **22** of the first embodiment. The bracket **420** has a distal (first) end portion **420***a* and a proximal (second) end portion **420***b*. A gripping portion **430** is arranged between the distal end portion **420***a* and the proximal end portion **420***b*. The proximal end portion **420***b* has a mounting surface **434** with the clamp **22** being attached to the mounting surface **434**. Thus, the clamp **22** is attached to the bracket **420** to mount the bracket **420** to the bicycle handlebar **12**.

Here, the bracket **420** includes a first bracket part **450** and a second bracket part **452**. The first and second bracket parts **450** and **452** are separate pieces from each other, and mate together to define an interior space **454**. The first and second bracket parts **450** and **452** are non-movably fixed to each other by a pair of fasteners or screws **464**. The first and second bracket parts **450** and **452** are further configured relative to each other such that a longitudinal connecting seam **456** (i.e., the outline of the interior face **460**) is formed on the exterior surface of the bracket **420** as seen in FIG. **19**. Basically, the longitudinal connecting seam **456** divides the bracket **420** in two halves that are basically mirrors images in the same manner as the first embodiment.

In this fifth embodiment, the first and second bracket parts **450** and **452** are further configured relative to each other to accommodate and support a hydraulic brake unit **424**A and a mechanical shifting unit **424**B. The hydraulic brake unit **424**A is configured to operate a hydraulic brake device (not shown). The electric control unit **424**B is configured to operate a bicycle electric device (not shown). Since the first and second bracket parts **450** and **452** can be configured to accommodate and support any hydraulic brake unit and any mechanical shifting unit, the hydraulic brake unit **424**A and the mechanical shifting unit **424**B will not be discussed and/or illustrated in detail herein. In other words, although the interior space **454** of the bracket **420** is different, the bracket **420** separates into two pieces in basically the same manner as the bracket **20**, discussed above. Thus, each of the hydraulic brake unit **424**A and the mechanical shifting unit **424**B constitutes a bicycle component operating unit that is disposed in the interior space **454** of the bracket **420**.

The hydraulic brake unit **424**A includes an operating member or brake lever **426** that protrudes toward outside of the interior space **454** of the bracket **420**. The hydraulic brake unit **424**A includes a master cylinder MC and a piston member P. The master cylinder MC is disposed inside of the gripping portion **430** of the bracket **420**. The piston member P is movably arranged in the as cylinder MC. **111** particular, the piston member P is moved toward the mounting surface**434** of the bracket **420** in response to operation of the operating member **426**. The master cylinder MC of the hydraulic brake unit **424**A is located rearward of the pivot axis Al of the operating member **426** while the bicycle component control device **410** is in an installed position as seen in FIGS. **18** and **19**. The operating member **426** is pivotally attached to the distal end portion **420**a of the bracket **420** about a pivot axis A1 to operate the hydraulic brake unit **424**A. Similarly, the mechanical shifting unit **424**B includes an operating member or shift lever **428** that protrudes toward outside of the interior space **454** of the bracket **420**. Here the operating member or lever **428** performs both a cable pulling operation and a cable releasing operation of the mechanical shifting unit **424**B.

Referring now to FIGS. **20** and **21**, a bicycle component control device in accordance with a sixth embodiment will now be explained. The bicycle component control device **510** has a bracket **520** configured to be used with the clamp **22** of the first embodiment. The bracket **520** has a distal (first) end portion **520***a* and a proximal (second) end portion **520***b*. A gripping portion **530** is arranged between the distal end portion **520***a*and the proximal end portion **520***b*. The proximal end portion **520***b* has a mounting surface **534** with the clamp **22** being attached to the mounting surface **534**. Thus, the clamp **22** is attached to the bracket **520** to mount the bracket **520** to the bicycle handlebar **12**.

Here, the bracket **520** includes a first bracket part **550** and a second bracket part **552**. The first and second bracket parts **550** and **552** are separate pieces from each other, and mate together to define an interior space **554**. The first and second bracket parts **550** and **552** are non-movably fixed to each other by a pair of fasteners or screws **564**. The first and second bracket parts **550** and **552** are further configured relative to each other such that a longitudinal connecting seam **556** (i.e., the outline of the interior face **560**) is formed on the exterior surface of the bracket **520** as seen in FIG. **21**. Basically, the longitudinal connecting seam **556** divides the bracket **520** in two halves that are basically mirrors images in the same manner as the first embodiment.

In this sixth embodiment, the first and second bracket parts **550** and **552** are further configured relative to each other to accommodate and support a hydraulic brake unit **524**A and an electric control unit **524**B that can be either an electric shift unit or a non-shifting control unit. The hydraulic brake unit **524**A is configured to operate a hydraulic brake device (not shown). The electric control unit **524**B is configured to operate a bicycle electric device (not shown). Since the first and second bracket parts **550** and **552** can be configured to accommodate and support any hydraulic brake unit and any electric control unit, the hydraulic brake unit **524**A and the electric control unit **524**B will not be discussed and/or illustrated in detail herein. In other words, although the interior space **554** of the bracket **520** is different, the bracket **520** separates into two pieces in basically the same manner as the bracket **20**, discussed above. Thus, each of the hydraulic brake unit **524**A and the electric control unit **524**B constitutes a bicycle component operating unit that is disposed in the interior space **554** of the bracket **520**.

The hydraulic brake unit **524**A includes an operating member or brake lever **526** that protrudes toward outside of the interior space **554** of the bracket **520**. The hydraulic brake unit **524**A includes a master cylinder MC and a piston member P. The master cylinder MC is disposed inside of the gripping portion **530** of the bracket **520**. The piston member P is movably arranged in the master cylinder MC. In particular, the piston member P is moved toward the mounting surface **534** of the bracket **520** in response to operation of the operating member **526**. The master cylinder MC of the hydraulic

brake unit **524**A is located rearward of the pivot axis A**1** of the operating member **526** while the bicycle component control device **510** is in an installed position as seen in FIGS. **20** and **21**. The operating member **526** is pivotally attached to the distal end portion **520***a* of the bracket **520** about the pivot axis A**1** to operate the hydraulic brake unit **524**A. Similarly, the electric control unit **524**B includes an operating member or shift lever **528** that is located on the operating member **526**, and thus, protrudes outside of the interior space **554** of the bracket **520**. More specifically, the electric control unit **52413** includes a switch unit **529**. The operating member **526** is operatively connected to the switch unit **529**. The operating member **526** is a brake lever having a unit mounting surface **526***a* that faces the bicycle handlebar **12** while the bicycle component control device **510** is in an installed position. The switch unit **529** is mounted on the unit mounting surface **526***a* as seen in FIG. **21**. Here, the operating member lever **528** is mounted on the switch unit **529** that performs both an upshifting operation by rotating the operating member lever **528** in a first direction and a downshifting operation by rotating the operating member lever **528** in a second (opposite) direction. The switch unit **529** is disposed outside of the bracket **520**, while the electric control unit **524**B is disposed inside of the bracket **520**. An electrical wire W electrically connects a main part of the electric control unit **52413** to the switch unit **529**.

While only selected embodiments have been chosen to illustrate the present invention, it will be apparent to those skilled in the art from this disclosure that various changes and modifications can be made herein without departing from the scope of the invention as defined in the appended claims. For example, the size, shape, location or orientation of the connecting seam can be changed so long as the connecting seam extends along at least three of the mounting surface, the upper surface, the lower surface, the first side surface and the second side surface. For example, in the fifth and sixth embodiments, the bracket parts can be divides such that the connecting seam is similar to any one of the second, third or fourth embodiments. In the case of the fourth embodiment, the connecting seam can separate the bracket along one of the first and second side surfaces, one of the upper and lower surfaces, and the mounting surface as needed and/or desired. Thus, the foregoing descriptions of the embodiments according to the present invention are provided for illustration only, and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.

What is claimed is:

1. A bicycle component control device comprising:

a bracket having a gripping portion, and a mounting surface disposed on a proximal end portion;

a mechanical shifting unit operatively mounted on the bracket and configured to operate a gear shifting device by pulling and releasing a shift cable; and

a hydraulic brake unit operatively mounted on the bracket and configured to operate a hydraulic brake device, the hydraulic brake unit including a master cylinder fixedly disposed inside of the gripping portion of the bracket so as to remain stationary with respect to the bracket during a braking operation, the master cylinder being disposed above the mechanical shifting unit,

the bracket including a first part and a second part, the second part being configured to detachably attach to the first part such that the first part and the second part cover the mechanical shifting unit,

the first and second parts of the bracket defining an interior space with the mechanical shifting unit being disposed in the interior space of the bracket, and the mechanical shifting unit having a shift lever protruding out of the interior space of the bracket.

2. The bicycle component control device according to claim **1**, wherein the master cylinder is disposed at least partially above of the mechanical shifting unit.

3. The bicycle component control device according to claim **1**, wherein the master cylinder is disposed entirely above of the mechanical shifting unit.

4. The bicycle component control device according to claim **1**, wherein the master cylinder is disposed directly above of the mechanical shifting unit.

5. The bicycle component control device according to claim **1**, further comprising

an operating member pivotally attached to the bracket about a pivot axis to operate the hydraulic brake unit.

6. The bicycle component control device according to claim **5**, wherein

the master cylinder is located rearward of the pivot axis of the operating member while the bicycle component control device is in an installed position.

7. The bicycle component control device according to claim **5**, wherein

the bracket has a distal end portion and a proximal end portion, the gripping portion of the bracket is arranged between the distal end portion and the proximal end portion, and the operating member is pivotally attached to the distal end portion of the bracket.

8. The bicycle component control device according to claim **7**, wherein

the mounting surface facing a bicycle handlebar, and the hydraulic brake unit has a piston member moved toward the mounting surface in response to operation of the operating member.

9. The bicycle component control device according to claim **1**, wherein

the master cylinder is disposed at least partially forward of the mechanical shifting unit.

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